

# Course Syllabus

## Syllabus: STAT 3202 – Remote Learning Introduction to Statistical Inference for Data Analytics, Spring 2021

### Course overview

#### Instructor

Instructor: Lun Li, PhD student - Department of Statistics

Email address: [li.9515@buckeyemail.osu.edu](mailto:li.9515@buckeyemail.osu.edu)

Lecture videos recorded by: Thomas Metzger, PhD

Email address: [metzger.181@osu.edu](mailto:metzger.181@osu.edu); **please do not use my Buckeyemail address, [metzger.181@buckeyemail.osu.edu](mailto:metzger.181@buckeyemail.osu.edu).**

Flipped Lecture: On Carmen Zoom, Tuesday and Thursday 9:30 am - 10:55 am

Zoom Link: <https://osu.zoom.us/j/95986419495?pwd=L3VNbXQvR1B3Nk9SSTVFhVjxWHZWUT09> (Links to an external site.)

Office hours: Virtual Hours via Carmen Zoom, Tuesday 3:40 pm - 4:40 pm or by appointment

Zoom Link: <https://osu.zoom.us/j/96955649455?pwd=cFJxTXdkTHlyRFM3L1FhbHhINitFdz09> (Links to an external site.)

#### Grader or Teaching Assistant

Pashmeen Kaur, PhD student - Department of Statistics

Email address: [hopper.129@buckeyemail.osu.edu](mailto:hopper.129@buckeyemail.osu.edu)

Lab section: On Carmen Zoom, Monday 12:00 pm - 12:50 pm

Zoom Link: <https://osu.zoom.us/j/97023237929?pwd=S2pjYWVObGZsOTNyR3lSeW5Od3NOQT09> (Links to an external site.)

#### Course description

Foundational inferential methods for learning about populations from samples, including point and interval estimation, and the formulation and testing of hypotheses. Statistical theory is introduced to justify the approaches. The course emphasizes challenges that arise when applying classical ideas to big data, partially through the use of computational and simulation techniques. Prereq: C- or better in 3201, or permission of instructor. Not open to students with credit for 4202.

### Course learning outcomes

By the end of this course, students should successfully be able to:

- Use the Central Limit Theorem to model the sample distribution of a sample mean

- Compare the performance of estimators via bias, mean squared error, consistency, and sufficiency
- Propose estimators via the method of moments and maximum likelihood estimation
- Use Monte Carlo simulation to model the performance of estimators and testing procedures
- Conduct hypothesis tests on mean and variance parameters,
- Determine and interpret the power and type-II error of a test
- Use bootstrapping to conduct inference
- Perform nonparametric hypothesis tests on mean parameters
- (Time permitting) Conduct and interpret Analysis of Variance
- (Time permitting) Define Bayesian statistics and investigate some simple problems involving inference on a proportion

## Course materials

Required: Stat 3202 Course Notes (electronic, on Carmen)

Optional (recommended) materials: *Mathematical Statistics with Applications, 7th edition*, by Wackerly, Mendenhall, and Scheaffer, Brooks/Cole, Cengage Learning, 2008. eBook PDFs are much cheaper and are highly encouraged.

## Course technology

For help with your password, university e-mail, Carmen, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at <https://ocio.osu.edu/help/hours> (Links to an external site.), and support for urgent issues is available 24x7.

- **Self-Service and Chat support:**<http://ocio.osu.edu/selfservice> (Links to an external site.)
- **Phone:**614-688-HELP (4357)
- **Email:**[8help@osu.edu](mailto:8help@osu.edu)
- **TDD:**614-688-8743

## Baseline technical skills necessary for online courses

- Basic computer and web-browsing skills
- Navigating Carmen

## Technology skills necessary for this specific course

- CarmenZoom (optional for Zoom office hours)

## Necessary equipment

- Computer: current Mac (OS X) or PC (Windows 10+) with high-speed internet connection
- Microphone: built-in laptop or tablet mic or external microphone (optional for Zoom office hours)

## Necessary software

- This class requires you to use the statistical software package called R (The R Project for Statistical Computing; <http://www.r-project.org/> (Links to an external site.)). This software package is available as free.
  - You can download R for Windows, Mac, and Linux, from the CRAN archive at <https://cran.r-project.org> (Links to an external site.).
  - An in-depth introduction to R is available at <http://cran.r-project.org/doc/manuals/R-intro.pdf> (Links to an external site.)

- Hands-on tutorials are available in the Swirl system, which you can learn about at <http://swirlstats.com/> (Links to an external site.). In particular, “R Programming: The basics of programming in R” is an appropriate first tutorial for students who have never used R.
- An easier to use interface to R is available in the software package RStudio. This package is available for Windows, Mac, and Linux and can be downloaded for free from <http://rstudio.org> (Links to an external site.). **Note that RStudio requires R to be installed.**
- [Microsoft Office 365 ProPlus](#) (Links to an external site.) All Ohio State students are now eligible for free Microsoft Office 365 ProPlus through Microsoft’s Student Advantage program. Each student can install Office on five PCs or Macs, five tablets (Windows, iPad® and Android™) and five phones.
  - Students are able to access Word, Excel, PowerPoint, Outlook and other programs, depending on platform. Users will also receive 1 TB of OneDrive for Business storage.
  - Office 365 is installed within your BuckeyeMail account. Full instructions for downloading and installation can be found <https://ocio.osu.edu/kb04733> (Links to an external site.).

## Course Delivery – Remote Learning

Lectures will be conducted live over Zoom on Wednesdays and Fridays from 12:45 pm - 2:05 pm. Although you are enrolled in the remote section, you are highly encouraged to attend the remote lectures live during these times. However, each lecture will be uploaded to YouTube shortly after this time for you to watch at your convenience within the next 24 hours. Online Carmen quiz-based lecture checks will be due at 11:59 pm the next day after a lecture is posted (so 11:59 pm Thursdays and Saturdays) to ensure you are staying up to date with content. **As you have undoubtedly learned over the last year of distance learning, falling behind on content leads to academic disaster and unnecessary stress. Please stay up to date on lecture videos and lecture checks.**

Lab tutorials and supplemental problems will be provided during recitation times. Lab assignments will be due at the end of each week. These meetings will be remote on Zoom all semester.

All submissions, such as homework assignments, will be virtual through Carmen.

## Grades

Assignment or category	Percentage
Homeworks	20%
Labs	20%
In-class assignments/Lecture checks	25%
Exam 1	10%
Exam 2	10%
Final Exam/Project	15%
Total	100%

**Grade Disputes:** if you believe an error has been made in grading, you have one week from the time the grade was posted to dispute the grade. Only the following will be considered grounds for a dispute:

- The grader simply didn't add up the points correctly.
- The grader did not see a correct answer that is on your submission.
- Your answer is the same as the correct answer, but in a different form; for instance, you said  $p < \alpha$ , but the grader was looking for  $\alpha > p$ ;
- Your answer to a free response question is essentially correct but stated slightly differently than the grader's interpretation.
- The points deducted from your work do not match the guidelines set by the grader's rubric.

### Assignment Information

**Lecture Checks:** after each lecture, you are responsible for completing a brief lecture check assignment covering that lecture's materials. Typically, lecture checks will take 10-15 minutes. Lecture checks should be completed before 11:59 pm the next day. You are encouraged to collaborate remotely on lecture check assignments, but ultimately the work you submit must be your own.

**Homeworks:** tentatively, there will be six homework assignments. Assignments should be submitted to Carmen as a .pdf file and organized according to the homework template. Every assigned problem should be completed, but only a subset of problems may be graded. You are encouraged to collaborate remotely on homework assignments, but ultimately the work you submit must be your own.

**Labs:** each week a lab assignment will incorporate the recent topics with coding. Labs will be due Fridays before 11:59 pm. You are encouraged to collaborate remotely on lab assignments, but ultimately the work you submit must be your own.

**Exams/assessments:** You must work independently on exams. You may not solicit help from other students or other online resources. Last semester, I submitted several students to the Committee on Academic Misconduct (COAM) for posting my exams on Chegg. Despite our unusual circumstances, **I take academic integrity very seriously and will submit any students who gain unauthorized aid to COAM.**

## Late Assignments

In general, late assignments will only be accepted at the instructor's discretion with a 10% deduction for each day past the deadline. The sooner I know of a potential problem, the better. If something is going to prevent you from submitting an assignment on-time, please reach out immediately. **I typically build in a short grace period for submissions, but once the answer key has been posted, absolutely no further assignments will be accepted.**

## Grading Scale

93–100: A  
90–92.9: A-  
87–89.9: B+  
83–86.9: B  
80–82.9: B-  
77–79.9: C+  
73–76.9: C  
70–72.9: C-  
67–69.9: D+  
60–66.9: D  
Below 60: E

## Attendance, participation, and discussions

### Student participation requirements

Students are expected to attend every lecture and every recitation. Because Ohio State does not have a universal student absence policy, absences will be considered on a case by case basis. Your case may be

strengthened with documentation such as doctor's notes, OSU athletics schedules, court summons, advance notice, and strong prior attendance. In the event of an excused and missed in-class assignment, recitation assignment, or exam, it is the student's responsibility to schedule a mutually agreeable time with their TA or professor to complete the assignment. Just because a student is absent does not guarantee they will be given an opportunity to make up an assignment.

## Discussion and communication guidelines

The following are my expectations for how we should communicate as a class. Above all, please remember to be respectful and thoughtful.

- **Writing style:** Please remember to use appropriate grammar, spelling, and punctuation. Your written comments on Carmen discussions are visible to all students, and emails are visible to me, so please make efforts to communicate professionally.
- **Tone and civility:** Please maintain a supportive learning community where everyone feels safe and where people can disagree amicably.
- **Citing your sources:** When we have academic discussions, please cite your sources to back up what you say. For the textbook or other course materials, list at least the title and page numbers. For online sources, include a link.
- **Backing up your work:** Consider composing your academic posts in a word processor, where you can save your work, and then pasting into the Carmen discussion.

## Other course policies

### Health and safety

The Ohio State University Wexner Medical Center's Coronavirus Outbreak site (<https://wexnermedical.osu.edu/features/coronavirus> (Links to an external site.)) includes the latest information about COVID-19 as well as guidance for students, faculty and staff. Guidelines and requirements for campus safety from the University's COVID-19 Transition Task Force were published on July 1 on the Safe and Healthy website (<https://safeandhealthy.osu.edu> (Links to an external site.)). They include the following:

- "A daily health check to report body temperature and health status will be required for all faculty, staff and students each day they intend to be on Ohio State's campuses in the autumn."
- Face masks must be worn in indoor settings, including classrooms. Noncompliant students will be asked to leave. I will have no patience whatsoever with students who put myself and others at risk.
- Members of the campus community will be required to sign a pledge "to affirm their understanding of what is needed to help fight the spread of the virus and their intention to do their part."
- "Accountability measures will be in place for those who refuse to abide by required health and safety guidelines."

## Potential disruptions to instruction

In the event you are unable to attend class for an extended period of time, please reach out to me as soon as possible. If it is reasonable for you to continue participating remotely, all materials will remain accessible for you.

In the event I am unable to participate for an extended period of time, I will let students know as soon as possible. A replacement instructor will be available through the Department of Statistics.

## Student support and academic services

Student academic services offered on the OSU main campus <http://advising.osu.edu/welcome.shtml> (Links to an external site.).

Student support services offered on the OSU main campus <http://ssc.osu.edu> (Links to an external site.).

# Academic integrity policy

## Policies for this online course

- **Lecture checks:** You are encouraged to collaborate remotely on lecture check assignments, but ultimately the work you submit must be your own.
- **Labs:** You are encouraged to collaborate remotely on lab assignments, but ultimately the work you submit must be your own.
- **Reusing past work:** In general, you are prohibited in university courses from turning in work from a past class to your current class, even if you modify it. If you want to build on past research or revisit a topic you've explored in previous courses, please discuss the situation with me.
- **Falsifying research or results:** All research you will conduct in this course is intended to be a learning experience; you should never feel tempted to make your results or your library research look more successful than it was.
- **Collaboration and informal peer-review:** The course includes many opportunities for formal collaboration with your classmates. While study groups and peer-review of major written projects is encouraged, remember that comparing answers on an exam is not permitted. If you're unsure about a particular situation, please feel free just to ask ahead of time.

## Academic Integrity

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct <http://studentlife.osu.edu/csc/> ([Links to an external site.](#)).

## Copyright disclaimer

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

## Statement on Title IX

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at <http://titleix.osu.edu> or by contacting the Ohio State Title IX Coordinator at [titleix@osu.edu](mailto:titleix@osu.edu).

## Accessibility accommodations for students with disabilities

**The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: [slds@osu.edu](mailto:slds@osu.edu) ([Links to an external site.](#)); 614-292-3307; [slds.osu.edu](http://slds.osu.edu) ([Links to an external site.](#)); 098 Baker Hall, 113 W. 12th Avenue.**

## Accessibility of course technology

This online course requires use of Carmen (Ohio State's learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations with your instructor.

- [Carmen \(Canvas\) accessibility \(Links to an external site.\)](#)
- Streaming audio and video
- Synchronous course tools

## Your mental health

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life's Counseling and Consultation Service (CCS) by visiting [ccs.osu.edu](https://ccs.osu.edu) ([Links to an external site.](#)) or calling 614- 292-5766. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on call counselor when CCS is closed at 614-292-5766 and 24 hour emergency help is also available through the 24/7 National Suicide Prevention Hotline at 1-800-273- TALK or at [suicidepreventionlifeline.org](https://suicidepreventionlifeline.org) ([Links to an external site.](#))

## Disclaimer

This syllabus should be taken as a fairly reliable guide for the course content. However, you cannot claim any rights from it and in particular we reserve the right to change due dates or the methods of grading and/or assessment if necessary. Any changes will be communicated to you through official course announcements.